

DESCRIPTIONS, SYNONYMY AND SEX ASSOCIATIONS IN
THE GENUS *EUCERCERIS* (HYMENOPTERA: PHILANTHIDAE)¹

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Abstract.—*E. geboharti*, *E. melleoides* and *E. sculleni*, n. spp. are described from western North America. *E. barri* Scullen is removed from synonymy, and *E. cavagnaroi* Scullen is elevated from subspecies to species status. *Aphilanthops marginipennis* Cameron is removed from synonymy with *E. rubripes* Cresson and placed in synonymy with *E. canaliculata* (Say). The male of *E. brunnea* Scullen and the female of *E. melanovittata* Scullen are characterized. *E. menkei* Scullen is the female and a junior synonym of *E. melanosa* Scullen.

Since Scullen's (1968) revision of the genus *Eucerceris* much additional material has become available. A study of this material has permitted recognition of three previously undescribed species, some new sex associations, and new or revised synonymy involving other species. The results and conclusions presented here are a continuation of those in Ferguson (1981).

Eucerceris geboharti Ferguson, n. sp.

Figure 1

Female.—Length 12–13 mm; forewing 8–9 mm; mandible with broadly triangular tooth deflected inward, slightly recurved, weakly bicuspidate; ventral margin of mandible swollen and elbowed slightly distad of middle, apical margin of clypeal midsection with 2 rounded lobes medially, connected basally, angled outward from plane of face (Fig. 1); preapical setae arising from underside of apical lobes; disc of clypeal midsection convex; eyes diverging below; mesopleural tubercle present; subalar carina strongly produced laterally into a roundly triangular lobe, projecting beyond tegula when viewed from above; scutal punctures separated by 1 to 3 puncture diameters; scutellum and metanotum polished with a few scattered punctures; propodeal enclosure polished with a few scattered punctures and/or weak ridges, median groove linear; mesopleuron ridged between punctures, hypoepi-

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meron with separated punctures; metapleuron densely ridged; propodeum densely striatopunctate except immediately adjacent to enclosure; second submarginal cell of forewing petiolate anteriorly; punctures on anterior and posterior ridges of terga II–IV coarse, well separated, polished between; transverse depressions of terga II–IV with smaller punctures, closely but irregularly spaced; hypopygium flat, with translucent area; pygidium subtriangular, narrowly rounded apically.

Male.—Length 10–11 mm; forewing 8–9 mm; mandible edentate with small membranous lobe on lower side slightly distad of midlength; clypeal margin with 3 rounded teeth of equal length; eyes slightly divergent below; clypeus sparsely punctate; lower face moderately punctate, upper face and vertex more or less contiguously punctate except punctures separated behind ocelli; subalar carina and punctation of thorax as in female; forewing with second submarginal cell sessile, marginal cell with a basoposterior pocket; fimbriae loosely clumped on sterna III and IV, that on III narrower than on IV; fimbria on sternum V denser, hairs shorter medially, somewhat irregular in length; pygidium narrowed apically, longer than basal width, distance between apicolateral teeth about $\frac{1}{2}$ basal width, strongly incised inside each lateral tooth with middle lobe wider than distance to tooth.

Coloration.—Much like *Eucerceris bitruncata* Scullen with which it has been confused; scape, pedicel and basal 5 or 6 flagellar segments fulvous to red, remainder of flagellum black; ground color of head mostly red in female, mostly black in male, with several yellow marks; thorax with black background and numerous yellow markings, more abundant in male; legs variably yellow, fulvous and red; wing veins yellowish to light brown, membrane lightly yellow stained, lightly infuscated apically; tergum VI red in female, pygidium infuscate apically; pygidium of male yellow to ferruginous.

Holotype.—Female, Utah, [Garfield County], Boulder, VI-28-75 (J. Alcock); University of California, Davis.

Paratypes.—4 males, 4 females as follows: UTAH: 2 females, same data as holotype [UCD, OSU]; 2 males, 2 females, Garfield County, Boulder, 7,200 ft., June 5, 1966 (G. E. Bohart) [USU, OSU]; 1 male, Emery County, July 20, 1921 [OSU]; 1 male, Emery County, Aug. 23, 1921 (Grace O. Wiley) [OSU].

Other specimen.—1 male, UTAH; Sphinx, June 14, 1950 (G. F. Knowlton), heavily cyanided [USU].

The sternal fimbriae of the males of *E. geboharti* are very much like those of *Eucerceris provancheri* (Dalla Torre). The fimbria on sternum V is narrower, more compact and the hairs are of more uniform length in the latter species. The two broadly rounded median lobes of the apical clypeal margin are diagnostic in the female. The strongly expanded subalar carina in both sexes is unique in the genus. The mesopleural tubercle, unidentate mandible, diverging eyes, and sparse punctation of the female, and the weak clypeal

teeth of the male place *E. geboharti*, n. sp. in the same species group with *Eucerceris barri* Scullen, *E. provancheri*, and *Eucerceris similis* Cresson.

Eucerceris melleoides Ferguson, n. sp.

Figure 2

Female.—Length 13 mm; forewing 10 mm; inner margin of mandible with blunt tooth slightly distad of midlength; clypeus with median domelike swelling, apicomedial margin with transverse, rectangular lamina beyond base of preapical setae, lamina as long as pedicel width and 3 times as wide as long, transverse apically, with poorly developed flanking tooth on each side (Fig. 2); clypeal punctures irregular, mostly well separated, remainder of head contiguously punctate; eyes diverging below; interocellar distance scarcely 2 lateral ocellus diameters and about half ocellocular distance; propodeal enclosure crossridged on anterior half, remainder polished; metapleuron finely ridged; scutellum polished on anterior half, remainder punctate; mesopleuron and propodeum contiguously punctate; mesopleural tubercle absent; second submarginal cell of forewing petiolate anteriorly; subalar carina not widened laterally; terga II–IV with dense, uniform, contiguous punctures in transverse depressions well differentiated from polished, more coarsely punctate anterior and posterior tergal ridges; sterna sparsely punctate; hypopygium flat, translucent area distinct; pygidium narrowly suboval, twice as long as wide.

Male.—Length 12–14 mm; forewing 9–11 mm; mandible edentate; clypeal lip with 3 teeth of equal size; eyes slightly diverging below; ocelli and sculpture of head as in female; forewing with second submarginal cell sessile, marginal cell with basoposterior pocket; sculpture of thorax as in female; sterna III–IV with numerous hairs but not differentiated into fimbriae; fimbria on sternum V about twice as wide as distance between apices of pygidial teeth, hairs long, somewhat ragged at the tips, irregularly clumped; pygidium with narrow median lobe projecting slightly beyond lateral teeth, distance between median lobe and lateral tooth equal to or greater than width of lobe; sculpture of abdomen as in female.

Coloration.—Background color black, pale markings yellow; 3 spots on clypeus, 3 stripes on face, spot behind eye, pronotal ridge, metanotum, spot on mesopleuron, spot on propodeal side, narrowly interrupted transverse band on tergum I, narrow transverse band on posterior ridge of terga II–V, lateral spots on sternum IV, yellow; mandible red, fulvous at base; scape, pedicel and flagellomeres I–II red, remainder of flagellum black; coxae black, remainder of legs mostly red; anterior $\frac{1}{3}$ of forewing infuscated, remainder of forewing and hindwing lightly smoky.

Holotype.—Female, Mexico, Coahuila, Los Pinos, 19 mi. SE Saltillo, IX-24-76, 6,800' (J. A. Chemsak, J. Powell, A. and M. Michelbacher). Uni-

versity of California, Berkeley. [To be deposited on indefinite loan at the California Academy of Sciences, San Francisco.]

Paratypes.—4 males, all from Mexico, as follows: 1 male, same data as holotype [UCB]; 1 male, Hidalgo, Zimapan, VI-11/14-51, on flowers of *Eysenhardtia polystachya* (Ort.) (P. D. Hurd) [UCB]; 2 males, Nueva Leon, 40 mi. W Linares, 5,200 ft., Sept. 7, 1963 (Scullen and Bolinger) [OSU].

The long middle lobe of the pygidium separates the males of this species from all others in the genus except *E. melanosa* Scullen and *E. mellea* Scullen. *E. melanosa* has the fimbria on sternum V reduced to a pair of pointed tufts medially, whereas the fimbria is distinctly transverse in *mellea* and *melleoides*, n. sp. The female of *melleoides*, n. sp. is much like *mellea*, but the apical margin of the clypeus is trilobed medially in *mellea* whereas it is transverse in *melleoides*, n. sp. I have been unable to separate *mellea* and *melleoides*, n. sp. males except by color; *mellea* is a red and yellow species whereas *melleoides*, n. sp. is essentially a black and white species.

Eucerceris sculleni Ferguson, n. sp.

Figure 3

Eucerceris melanovittata, Scullen 1968:39, figs. 77a, b, d, f, females only, nec Scullen 1939.

Female.—Length 14–16 mm; forewing 10–12 mm; mandible large, thick, with blunt tooth having long axis subparallel to long axis of mandible; disc of clypeal midsection with large protuberance, bluntly rounded apically with apex closer to clypeofrontal suture than to apical clypeal margin and above a line drawn between tentorial pits; lateral clypeal teeth large, bluntly triangular, closer to each other than to eye margin; transverse lamella connected to underside of lateral teeth, in front of and below preapical setae, with a bluntly bidentate median elevation on lamella; clypeus and face densely punctate, punctures essentially contiguous in area below midocellus; interocellar distance about half ocellocular distance; eyes diverging below; mesopleural tubercle indistinct; scutal punctures dense anteriorly, separated by 1 to 2 puncture diameters across middle $\frac{1}{3}$, surface polished; propodeal enclosure polished, weakly sculptured, a few foveae in midline and a few weak ridges anteriorly; subalar carina not laterally expanded; forewing with second submarginal cell petiolate anteriorly; anterior and posterior ridges of middle terga with large separated punctures, well differentiated from dense, small punctures in transverse depressions; pygidium twice as long as midwidth, narrowly rounded apically, slightly narrowed basally; hypopygium with large, evenly rounded transverse swelling posteriorly (Fig. 3) with transverse or broadly U-shaped carina at base, translucent area absent.

Male.—Length 13–15 mm; forewing 10–11 mm; clypeal lip with strong

teeth, midtooth slightly longer; eyes slightly diverging below; ocelli and punctuation of head as in female; thorax punctured as in female except scutal punctures separated by less than 1 puncture diameter; forewing with second submarginal cell sessile, marginal cell with basoposterior pocket; sterna III–IV without fimbriae; sternum V with sharply rectangular fimbria, hairs very dense, uniform in length, fimbria about 3 times as wide as length of hairs; pygidium transversely swollen at apical $\frac{1}{3}$ with lateral carinae converging from base to middle, subparallel over apical $\frac{1}{2}$, median lobe not extending beyond lateral teeth; punctuation of abdomen as in female.

Coloration.—Similar in color pattern to red marked specimens of *E. rubripes* Cresson; background color black, usually replaced in part by red; pale markings usually bright yellow; 3 spots on clypeus, 3 lines on face with middle one more or less reaching midocellus, spot behind eye, sometimes spots behind ocelli, pronotal collar and lobes, hypoepimeron, scutellum, metanotum, propodeal sides, spots behind mid and hind coxae, incised or interrupted band on tergum I, complete transverse band on posterior ridge of terga II–V, complete or partial transverse band on anterior ridge of terga II–V, transverse band or lateral spots on one or more of sterna II–IV, yellow; scape, pedicel and basal 2 to 4 flagellomeres reddish, remainder of flagellum black; legs red, coxae sometimes infuscated; forewing infuscate along anterior $\frac{1}{3}$ and distal $\frac{2}{3}$. Males colored like females except legs marked with yellow.

Holotype.—Female, Willcox, [Cochise County], Arizona, July 7, 1956 (A. D. Telford); University of Arizona, Tucson. [Deposited in the California Academy of Sciences, San Francisco.]

Paratypes.—16 males, 6 females, as follows: ARIZONA: 1 male, 2 females, same data as holotype [UAZ, OSU] [Note: one of these females [OSU] carries a *Eucerceris melanovittata* Scullen determination label and a yellow Plesio-type label affixed by Scullen.]; 1 male, Cochise County, 3 mi. SE Willcox, VIII-29-57, on *Cleome* sp. (W. F. Barr) [UID]; 1 male, Cochise County, Willcox, VIII-18-58 (P. D. Hurd) [UCB]; 2 males, Graham County, 12 mi. S Stafford, 4,250 ft., IX-14-62 (H. A. Scullen) [OSU]; 1 male, Navajo County, 1 mi. SW entr. Navajo Nat. Mon. VIII-2-67 (D. C. and K. A. Rentz) [UCB]; 1 male, Pima County, Baboquiviri Mts., near Kits Peak, VIII-7/9-1916, about 3,600 ft., [AMNH]; 2 males, Pima County, Baboquiviri Mts., VIII-15-1924, VIII-18-1924 (O. C. Poling) [CAS]; 1 male, Pima County, Nogales Springs, Whetstone Mtns., VIII-17-77, 4,400–4,600 ft. (Werner, Olson, Hetz) [UAZ]; 1 female, Pima County, 3 mi. SE Continental, VIII-26-76 (S. Kuba) [CDA]; 1 male, Pima County, Greaterville, X-8-80 (B. F. and J. L. Carr) [ALB]; 1 male, Santa Cruz County, 5 km N Nogales, VIII-17-79 (J. v. d. Vecht) [UCD]; 1 male, 1 female, Santa Cruz County, 5 mi. E Nogales, IX-1-70 (R. M. Bohart) [UCD]; COLORADO: 1 female, Costilla County, San Luis, VIII-11-76 (B. F. and J. L. Carr) [ALB]; NEW MEXICO: 1 male,

Hidalgo County, Skeleton Cyn., VIII-12-65 (G. W. Forister) [UCR]; 2 males, Santa Fe County, Santa Fe, VII-14-34 (F. E. Lutz), IX-2-34 (P. E. Geier) [AMNH]; TEXAS: 1 female, Jeff Davis County, Davis Mts., IX-4-44 (F. Werner and W. Nutting) [MCZ]. [Note: This specimen carries a *Eucerceris melanovittata* Scullen determination label, a yellow Plesiotype label, and an orange "D" label, the latter indicating that the specimen was used for the illustration of *E. melanovittata* in Scullen (1968).]

Other specimen.—1 female, Mexico, Chihuahua, La Campana, IX-8-73 (W. J. Hanson, B. A. Haws) [USU].

The strongly swollen hypopygium separates the female of *E. sculleni*, n. sp. from all other species in the genus; otherwise it is very similar to *E. melanovittata* except for the larger size and partly red markings of the former. The sharply rectangular fimbria on sternum V and lack of fimbriae on sternum III and IV separate the males of *E. sculleni*, n. sp. from its congeners except for *E. melanovittata* and *E. sinuata* Scullen. *E. sinuata* has the anterior transverse ridges of the midterga finely punctate, similar to the punctures of the transverse depressions, whereas in the other two species the anterior transverse ridges are polished between well separated large punctures, the anterior ridges being similar to the posterior ridges. Males of *E. sculleni*, n. sp. are very similar to males of *E. melanovittata* morphologically. Males of *sculleni*, n. sp. are larger (13–15 mm) than males of *melanovittata* (11–13 mm), and the latter are black and white whereas in *sculleni*, n. sp. there are variable amounts of red and the pale markings are yellow. The scape and pedicel are red in *sculleni*, n. sp. but black or piceous in *melanovittata*.

E. sculleni, n. sp. has not been collected in the Portal area of Cochise County, Arizona, where *E. melanovittata* is relatively common. The specimen from the state of Chihuahua, Mexico, is black and white, but it has the strongly swollen hypopygium characteristic of *E. sculleni*, n. sp.

Eucerceris barri Scullen (Revised Status)

Eucerceris barri Scullen, 1968:19. [Female holotype, Jacob's Cabin, Hart Mtn., Lake County, Oregon; U.S. Natl. Mus. Nat. Hist., Washington, D.C.] *Eucerceris similis*, Bohart and Grissell 1975:33, nec Cresson, in part; Bohart and Menke 1976:592, in part; Krombein 1979; 1740, in part.

Bohart and Grissell (1975) synonymized *Eucerceris barri* Scullen with *Eucerceris similis* Cresson presumably because of the similarity of the males of the two species. Bohart has recognized *barri* in subsequent determinations. Females of the two species are quite distinct in clypeal structure. *E. similis* has four teeth on the apicomedial margin of the clypeus with all teeth equally separated from each other. *E. barri* lacks the two median teeth, and the apicomedial emargination of the clypeus is bounded by a carina or rim which connects with the lateral teeth. Each lateral tooth is formed by a blunt,

triangular expansion of the apical rim and the tooth is sometimes bicuspidate. In *E. similis* the preapical setae arise from the apical clypeal margin, whereas in *E. barri* they arise from underneath the apical rim.

Males of *barri* and *similis* are separable by differences in antennal coloration. In *similis* the flagellum is black or infuscate above and at least the apical 3 to 5 segments are black below. In *barri* the flagellum is fulvous to light brown below for its entire length and partly to entirely pale above. In about 75% of the male specimens of *barri* the pale facial maculations are fused above the antennal sockets and almost fused in the remainder. In *similis* the black stripes above the antennal sockets are of more or less uniform width with no strong tendency toward fusion of the pale stripes.

The pale markings of *barri* are whitish, whereas they are usually distinctly yellow in *similis*. The pale markings are much reduced in *barri* females, as the face and head are often completely black, the sterna are black, and the femora are black with an occasional apical pale spot.

Material examined.—87 males including 8 paratypes and a male collected with the holotype female; 29 females including the holotype and 4 paratypes. The California distribution data are given in detail since these records are the southern extension of the range of this predominantly northern species. County records are given for the remaining states with elevations when stated on the labels. CALIFORNIA: 1 female, Lassen County, 4 mi. S Ravendale, VIII-10-59 (J. A. Chemsak), paratype [UCB]; 2 males, Mono County, Crooked Creek Lab., White Mtns., 10,150 ft., VII-19-61 (G. L. Stage) [UCB]; 1 male, Mono County, Blanco's Corral, White Mtns., 10,150 ft., VIII-25-60 (P. D. Hurd) [UCB]; 3 males, Mono County, Cottonwood Cr., 9,300 ft., VII-10-61 (H. V. Daly) [UCB]. IDAHO: Camas, Cassia, Clark, Custer (5,899 ft.), Fremont, Jefferson, Jerome, Lemhi, Oneida and Teton Counties [UCD, UID, OSU, USU]. NEVADA: Lander and White Pine Counties [UCD, UID]. OREGON: Lake County [OSU, USNM]. UTAH: Rich County [USU]. WYOMING: Albany, Carbon (8,800 ft.), Natrona (7,000 ft.), Sublette, Sweetwater, Teton, Uinta (7,000 ft.) Counties and Yellowstone National Park [UCB, UCD, CSU, COR, NEB, OSU, USNM]. In addition, Scullen (1968) reported a male from Moffat County, Colorado.

Collection dates are July 2 to August 28 with the exception of one male collected in Lemhi County, Idaho, on June 21.

Eucerceris brunnea Scullen

Eucerceris brunnea Scullen, 1948:159. [Female holotype, Jacala, Hidalgo, Mexico; Mus. Comp. Zool. Cambridge, Massachusetts]; Scullen 1968:22; Bohart and Menke 1976:591.

Eucerceris velutina, Scullen 1948:160, males in part; Scullen 1968:69, males in part.

The males of *Eucerceris brunnea* Scullen have not heretofore been characterized. A series of specimens collected by H. E. Evans at Guadalajara Mexico, in 1959 and 1965 [COR, OSU, USNM] contained females of both *E. brunnea* and *Eucerceris velutina* Scullen together with a number of superficially similar males which had been determined as *E. velutina* by Scullen. It seemed probable that these males were not all conspecific, but that males of both *brunnea* and *velutina* were present. Although females of *brunnea* and *velutina* are easily separated by their markedly different clypeal structure, the two belong to the same species group on the basis of wing venation and other characters. A similarity in the males of the two species would therefore not be surprising.

Since surface sculpture is only weakly sexually dimorphic in the genus *Eucerceris*, characters based on sculpture are important clues in associating the opposite sexes of a species. It was found that there were substantial differences in surface sculpture between females of *brunnea* and *velutina*, and that the series of males collected at Guadalajara, Mexico, separated readily into two groups each of which corresponded in sculpture to one of the two species of females with no intergradation between the two.

Both sexes of *velutina* have the anterior and posterior transverse ridge of terga III-IV sharply differentiated in punctation from the transverse furrow of the same tergum. The transverse furrow is densely, contiguously punctate with small, mostly hexagonal punctures, whereas the transverse ridges are polished between large punctures mostly separated by one or more puncture diameters. Both sexes of *brunnea* have punctation similar to *velutina* on the posterior tergal ridge and in the transverse furrow of the same terga, but the anterior transverse ridge is punctured almost as densely as the furrow.

Males collected with *velutina* females in the absence of *brunnea* females, and males collected with *brunnea* females in the absence of *velutina* females show an identical pattern of tergal punctation.

The dense, black, "carpet-like," velvety pile on the scutum of males of *brunnea* and *velutina* is a highly unusual character state. Since *Eucerceris cavagnaroi* Scullen, *Eucerceris punctifrons* (Cameron), and *Eucerceris violaceipennis* Scullen belong to the same species group on the basis of female wing venation, I strongly suspect that the males of these latter three species, when found, will also possess this character.

Specimens examined.—The following records for *E. brunnea* Scullen are all from Mexico: CHIHUAHUA: 2 males, 1 female, Cuiteco, VIII-9-69 [UCD]; HIDALGO: 1 male, 28 mi. SW Jacato, 6,300 ft., VI-23-57 [OSU]; JALISCO: 7 males, 4 females, Guadalajara, VII-14-59 [COR], VII-17/28-65 [OSU, USNM]; MICHOACAN: 1 male, 1 female, 6 mi. NW Quiroga, VII-11-63 [UCD]. I have also seen the male holotype of *Eucerceris velutina* Scullen at the U.S. National Museum of Natural History, Washington. It is not at the California Academy of Sciences, San Francisco, as reported by Scullen (1968).

Eucerceris canaliculata (Say)

Aphilanthops marginipennis Cameron, 1890:105. [Male holotype, Atoyac, Veracruz, Mexico; Brit. Mus. (Nat. Hist.), London.] *New Synonymy*.

Aphilanthops marginipennis Cameron was incorrectly synonymized with *Eucerceris rubripes* Cresson by Scullen (1968) and should be added to the synonymy of *Eucerceris canaliculata* (Say) as given by Ferguson (1981). The type locality of *marginipennis* is outside the known range of *rubripes*, and the original description of *marginipennis* does not fit *rubripes*.

I have studied the holotype male of *marginipennis* which consists of a head and thorax without a gaster. Nevertheless, the available parts of the holotype taken together with Cameron's (1890) original description make identification possible. Cameron described the fimbriae on sterna III and IV as occupying the middle three-fourths of the sterna and stated that the hairs were nearly as long as the segments. He described the fimbria on sternum V as "stiff, comb-like, almost continuous," and the abdomen as mostly yellow except for the tergal depressions. This pattern of sternal fimbriae occurs only in *E. canaliculata* (Say) and *Eucerceris atrata* Scullen. *E. atrata* is a black and white species known only from elevations of 5,500 to 7,300 ft. in the state of San Luis Potosi, Mexico (Scullen 1968). *Eucerceris conata* Scullen has a very narrow, stiff fimbria on sternum V, but the mandible is rather strongly elbowed medially, quite different from the mandible of the holotype of *marginipennis*, and the distribution is similar to that of *rubripes*.

The holotype of *marginipennis* has a black scutum and extensive black markings on the thoracic pleura and propodeum. It is an example of the dark color form of southern Mexico and Guatemala described by Scullen (1968) as *Eucerceris zimapanensis* and previously synonymized with *E. canaliculata* by Ferguson (1981).

In my previous paper (Ferguson 1981) I neglected to give the reasons for deleting *Cerceris cameroni* Schulz from the synonymy of *Eucerceris canaliculata* (Say) as listed by Scullen (1951, 1968), Bohart and Menke (1976), and Krombein (1979). *Cerceris cameroni* was proposed by Schulz (1906) as a new name for the Indian species *Cerceris canaliculata* Cameron, nec Say, nec Perez, and is a synonym of *Cerceris bimaculata* Cameron according to Turner (1912). Bohart and Menke (1976) list *C. cameroni* Schulz in the synonymy of both *Eucerceris canaliculata* (Say) and *Cerceris bimaculata* Cameron, the latter being correct according to my interpretation.

Eucerceris cavagnaroi Scullen (New Status)

Eucerceris punctifrons cavagnaroi Scullen, 1968:53. [Female holotype, Volcan de San Salvador, El Salvador; Univ. of California, Davis]; Bohart and Menke 1976:592.

Scullen (1968) separated this taxon from *Eucerceris punctifrons* (Cameron)

on the basis of color characters. Examination of the types of *E. punctifrons* and *E. cavagnaroi* shows that they are morphologically distinct species. In *E. cavagnaroi* the apical clypeal lip is very narrow, not or scarcely wider than the diameter of an antennal socket, and with a distinct emargination at the base of the lip on each side. In *E. punctifrons* the apical clypeal lip is wider than an antennal socket diameter and forms a shoulder on each side at its base at which point the width of the lip is about as wide as the width of the subantennal sclerite. The size of the apical clypeal lip in *punctifrons* is intermediate between the very narrow lip of *cavagnaroi* and the very wide lip of *Eucerceris velutina* Scullen, the lip being distinctly wider than the subantennal sclerite in the latter (Figs. 4-6).

Differences also exist in tergal and propodeal punctation. In *cavagnaroi* the anterior transverse tergal ridges of terga III-IV have dense punctures, almost as dense as those in the transverse tergal depressions, with virtually no interspaces of more than one puncture diameter. In *punctifrons* the anterior tergal ridges have numerous interspaces of more than one puncture diameter being somewhat intermediate between *cavagnaroi* and *velutina*. The transverse tergal depressions are rather broad in *cavagnaroi*, about 6 to 8 punctures in width, whereas they are quite narrow in *punctifrons*, being about 3 to 4 punctures in width. The propodeum of *cavagnaroi* is densely punctured with virtually no interspaces of more than one puncture diameter, whereas the propodeum of *punctifrons* has numerous interspaces of more than one puncture diameter.

Material examined.—Holotype female of *Eucerceris punctifrons cavagnaroi* Scullen [UCD]; holotype female of *Aphilanthops punctifrons* Cameron [BMNH]; 1 female of *E. cavagnaroi* Scullen, El Salvador, Santa Tecla, 638 m, 28-VI-1974 (C. G. Dean, B. M. 1974-366) [BMNH].

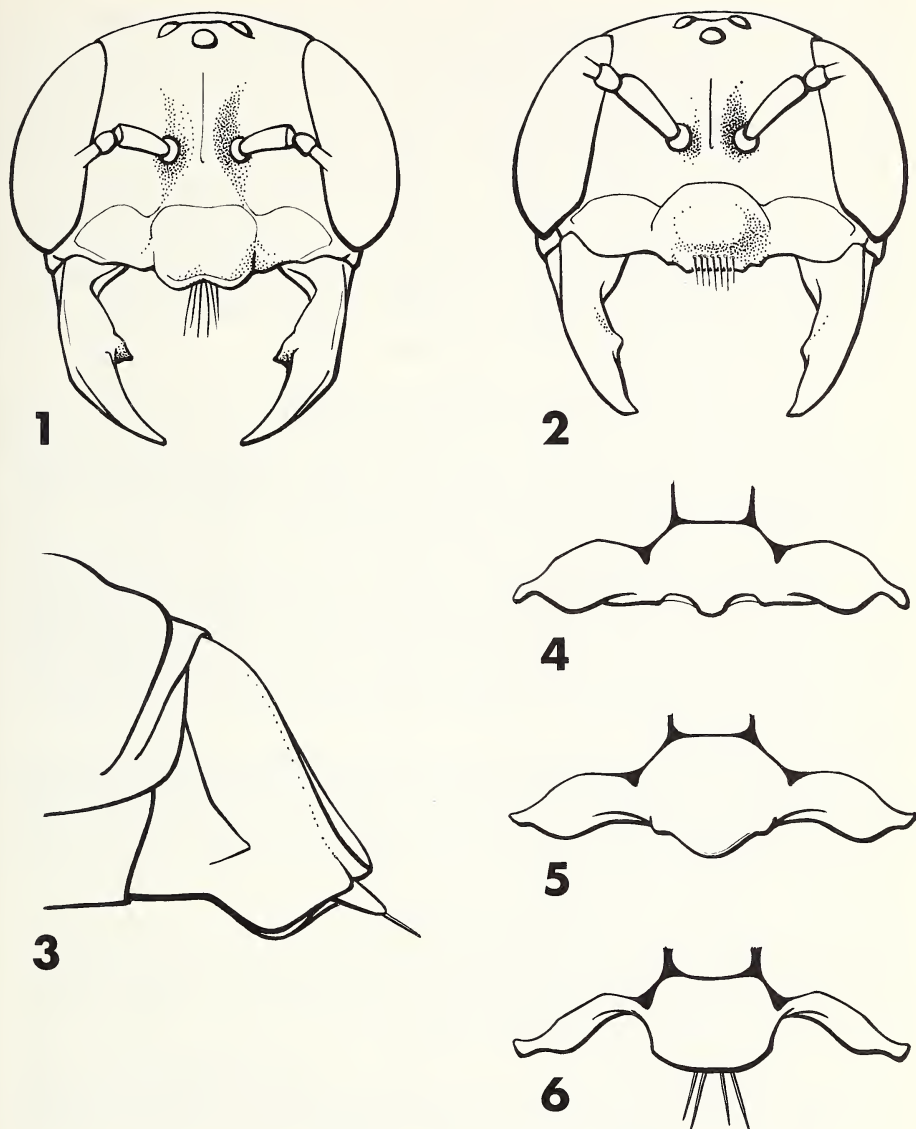
Eucerceris melanosa Scullen

Eucerceris melanosa Scullen, 1948:163. [Holotype male, Tehuacan, Puebla, Mexico; U.S. Natl. Mus. Nat. Hist., Washington]; Scullen 1968:38; Bohart and Menke 1976:591.

Eucerceris menkei Scullen, 1968:42. [Holotype female, 10 mi. NW Tamaulapan, Oaxaca, Mexico; Univ. of California, Davis]; Bohart and Menke 1976:591. *New Synonymy.*

Scullen (1968) suggested that *Eucerceris menkei* might be the female of *Eucerceris melanosa* Scullen. A male and female collected together in the state of Oaxaca, Mexico, were available to him [OSU]. In addition I have seen a male collected with two females in the state of Puebla, Mexico [UCB].

The two species are of similar size, color pattern and surface sculpture, and they are the only two species in south central Mexico for which opposite sexes have not been identified. These facts and observations taken together



Figs. 1-6. 1, 2. Head of female of *E. geoharti*, n. sp. (1) and *E. melleoides*, n. sp. (2); head width 3.1, 3.5 mm respectively. 3. Side view of terminal gastral segments of *E. sculleni*, n. sp. female; length of hypopygium 1.2 mm. 4-6. Clypeus of female *E. cavagnaroi* Scullen (4), *E. punctifrons* (Cameron) (5), and *E. velutina* Scullen (6); clypeal width 2.9, 2.9 and 3.2 mm respectively.

with the collection records leave no doubt that *melanosa* and *menkei* represent opposite sexes of the same species.

Specimens examined.—The following records are all from Mexico. HIDALGO: 1 female, Zimapan, VII-14-68 [UCD]; 1 male, 5 mi. W Pachuca, 7,900 ft. VIII-25-62 [OSU]; MEXICO D.F.: 1 male, 2,300 m, VIII-26-28 [COR]; OAXACA: 1 male, 1 female, 8 mi. SW Oaxaca, Monte Alban ruins, 6,000–6,500 ft., VIII-23-63 [OSU]; PUEBLA: 1 male, 2 females, 2 km E Tecamachalco, VII-4-74 [UCB]; 1 female, 275 km NE Chapulco, VIII-2-65 [COR]; 1 male paratype, 18 mi. W Tehuacan, 6,200 ft., IX-5-57 [OSU]; 1 male paratype, Cacaloapan, IV-26-62 [OSU]; QUERETARO: 1 male paratype, 41 mi. N Queretaro, 6,500 ft., IX-19-63 [OSU].

Eucerceris melanovittata Scullen

Eucerceris melanovittata Scullen, 1948:164. [Male holotype, 25 mi. E El Paso, Texas; Calif. Acad. of Sci., San Francisco]; Scullen 1968:39, males only; Bohart and Menke 1976:591; Krombein 1979:1739.

Scullen (1948) described *Eucerceris melanovittata* from males, and later (Scullen 1968) described what he thought was the female based on two specimens of a species described earlier in this paper as *Eucerceris sculleni*. The two males mentioned by Scullen (1968) as representing a darker form of *melanovittata* belong to the species described earlier in this paper as *Eucerceris melleoides*.

The true female of *E. melanovittata* was found among specimens carrying *Eucerceris arenaria* Scullen determination labels. Several females with associated males have also been identified in collections submitted for determination. *E. melanovittata* and *E. arenaria* are almost identical in size and coloration, both being black and white species. In males of *arenaria* the fimbria on sternum V is about $\frac{3}{4}$ as wide as the sternum, and the hairs are shorter medially; whereas in males of *melanovittata* this fimbria is narrower, sharply rectangular and the hairs are of even length. The females differ in several morphological characters as follows:

<i>E. melanovittata</i>	<i>E. arenaria</i>
(1) Clypeal elevation with apex above the middle	Clypeal elevation with apex below the middle
(2) Clypeal teeth with long axis directed forward	Clypeal teeth with long axis directed slightly outward
(3) Face below midocellus densely and regularly punctate	Face below midocellus irregularly punctate with many interspaces of one puncture diameter or more
(4) Hypopygium shagreened, without translucent area	Hypopygium with a translucent area

- | | |
|---|---|
| (5) Propodeal enclosure smooth, weakly sculptured | Propodeal enclosure ridged over most of surface |
| (6) Mandible with single blunt tooth | Mandible bicuspidate, small tooth arising from base of larger tooth |
| (7) Subapical clypeal process separated from lateral teeth by width of process | Subapical clypeal process separated from lateral teeth by more than width of process |
| (8) Distance from lateral tooth to eye margin greater than distance between lateral teeth (ratio 1.5/1.1) | Distance from lateral tooth to eye margin slightly less than distance between lateral teeth (ratio 1.4/1.5) |

Specimens examined.—I have studied the holotype male of *Eucerceris melanovittata* Scullen [CAS] and the holotype female of *Eucerceris arenaria* Scullen [CAS]. In addition I have seen 66 males and 32 females of *E. melanovittata* [AMNH, AZS, CAS, CDA, UCB, UCD, COR, UFL, OSU, PUC, USNM] with the following distribution: ARIZONA: Cochise, Graham, and Santa Cruz Counties; NEW MEXICO: Hidalgo, San Miguel and Torrance Counties; TEXAS: Brewster, Culberson, El Paso, Hudspeth, Jeff Davis and Presidio Counties. I have seen 1 male specimen from each of the states of Coahuila and Nueva Leon, Mexico.

Eucerceris pimarum Cockerell and Rohwer

Ferguson (1981), following previous authors, incorrectly cited Rohwer as the author of this species. Menke and Bohart (1979) pointed out that authorship of the species is Cockerell, T. D. A. and S. A. Rohwer 1908:326, in Rohwer, S. A. 1908. New philanthid wasps. *Can. Entomol.* 40:322–327.

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